

AMENDMENTS TO THE CLAIMS:

1. (Previously presented) A component mounting apparatus comprising:
- component supply sections for accommodating a plurality of components, said component supply sections being arranged on opposite sides of a board positioning section, respectively;
- a first mounting head section including
- (i) a rotary member constructed and arranged to be rotatively driven about a horizontal axis,
 - (ii) component suction nozzles attached to said rotary member along respective axes,
- and
- (iii) a recognition section opposed to said rotary member,
- said first mounting head section being constructed and arranged to
- (a) perform successive suction operations in order to pick up components from one of said component supply sections via said component suction nozzles, respectively,
 - (b) perform, via said recognition section upon intermittent rotation of said rotary member, successive recognition operations of the components respectively sucked by said component suction nozzles, and
 - (c) successively mount the components, respectively sucked by said component suction nozzles, onto a board at said board positioning section upon intermittent rotation of said rotary member; and
- a second mounting head section including
- (i) a rotary member constructed and arranged to be rotatively driven about a horizontal axis,
 - (ii) component suction nozzles attached to said rotary member along respective axes,
- and
- (iii) a recognition section opposed to said rotary member,
- said second mounting head section being constructed and arranged to
- (a) perform successive suction operations in order to pick up components from another one of said component supply sections via said component suction nozzles, respectively,

(b) perform, via said recognition section upon intermittent rotation of said rotary member, successive recognition operations of the components respectively sucked by said component suction nozzles, and

(c) successively mount the components, respectively sucked by said component suction nozzles, onto the board at said board positioning section upon intermittent rotation of said rotary member.

2. (Previously presented) The component mounting apparatus according to claim 1, wherein each of said first and second mounting head sections further includes nozzle rotation driving mechanisms for rotating corresponding said component suction nozzles, respectively, around the respective axes with respect to a corresponding said rotary member, and

each of said component suction nozzles of said first and second mounting head sections is constructed and arranged to be rotated around its respective axis by a respective one of said nozzle rotation driving mechanisms in accordance with recognition results from a corresponding said recognition section, so as to perform successive adjustment of postures of the components sucked by said corresponding said component suction nozzles.

3. (Previously presented) The component mounting apparatus according to claim 1, wherein said rotary member of each said first and second mounting head sections is constructed and arranged to be intermittently rotated at regular angular intervals at a corresponding one of said component supply sections,

such that at an angular position of said rotary member where a corresponding one of said component suction nozzles is opposed to a component of said corresponding one of said component supply sections, another corresponding one of said component suction nozzles is opposed to a corresponding said recognition section.

4. (Previously presented) The component mounting apparatus according to claim 1, wherein said rotary member of each said first and second mounting head sections is constructed and arranged

to be intermittently rotated at regular angular intervals at a corresponding one of said component supply sections,

such that a component sucked by a corresponding one of said component suction nozzles is opposed to a corresponding said recognition section during rotation of said rotary member.

5. (Previously presented) The component mounting apparatus according to claim 1, wherein each of said first and second mounting head sections further includes an illuminator for illuminating the components sucked by corresponding said component suction nozzles when each of the components is opposed to a corresponding said recognition section.

6. (Previously presented) The component mounting apparatus according to claim 1, wherein each of said first and second mounting head sections further includes

- (i) a head main body which includes a corresponding said rotary member,
- (ii) a frame which supports said head main body and a corresponding said recognition section, and
- (iii) an elevation mechanism for elevating said head main body with respect to said frame.

7. (Previously presented) The component mounting apparatus according to claim 1, wherein each of said first and second mounting head sections further includes:

- (i) a head main body which includes a corresponding said rotary member,
- (ii) a frame which supports said head main body and a corresponding said recognition section, and
- (iii) an elevation mechanism for elevating said frame.

8. (Previously presented) The component mounting apparatus according to claim 1, wherein said rotary member of each said first and second mounting head sections is constructed and arranged to rotate at a lower speed at an end of rotation thereof with respect to a speed at a start of the rotation.

9. (Previously presented) The component mounting apparatus according to claim 1, wherein said first and second mounting head sections are independently movable between said component supply sections and said board positioning section, respectively, and

said first mounting head section is constructed and arranged to perform successive mounting of components onto the board positioned at said board positioning section while said second mounting head section performs successive component suction and recognition operations at a corresponding one of said component supply sections.

10. (Previously presented) The component mounting apparatus according to claim 9, wherein one of said first and second mounting head sections is constructed and arranged to mount components at high speed, and the other of said first and second mounting head sections is constructed and arranged to mount components that require mounting with a high degree of precision.

11. (Previously presented) The component mounting apparatus according to claim 1, wherein either of said first and second mounting head sections is constructed and arranged to be selectively operated in accordance with a type of board positioned at said board positioning section, and

one of said first and second mounting head sections is constructed and arranged to mount larger components, and the other of said first and second mounting head sections is constructed and arranged to mount smaller components.

12. (Previously presented) The component mounting apparatus according to claim 1, wherein either of said first and second mounting head sections is constructed and arranged to perform suction of larger components after finishing suction of smaller components.

13. (Previously presented) The component mounting apparatus according to claim 1, wherein either of said first and second mounting head sections is constructed and arranged to mount smaller components after mounting larger components.

Claims 14-24 (Cancelled)

25. (Previously presented) A component mounting apparatus comprising:
component supply sections for accommodating a plurality of components, said component supply sections being arranged on opposite sides of a board positioning section, respectively;
a first mounting head section including
 (i) a first rotary member constructed and arranged to be rotatively driven about a horizontal axis, and
 (ii) first component suction nozzles attached to said first rotary member along first respective axes;
a second mounting head section including
 (i) a second rotary member constructed and arranged to be rotatively driven about a horizontal axis, and
 (ii) second component suction nozzles attached to said second rotary member along second respective axes;
a first recognition section; and
a second recognition section,
wherein said first mounting head section is constructed and arranged to
 (a) perform successive suction operations in order to pick up components from one of said component supply sections via said first component suction nozzles,
 (b) move to said first recognition section so as to have performed, upon rotation of said first rotary member, successive recognition operations of the components respectively sucked by said first component suction nozzles, and
 (c) successively mount the components, respectively sucked by said first component suction nozzles, onto a board at said board positioning section upon rotation of said first rotary member, and
wherein said second mounting head section is constructed and arranged to
 (a) perform successive suction operations in order to pick up components from another one of said component supply sections via said second component suction nozzles,

(b) move to said second recognition section so as to have performed, upon rotation of said second rotary member, successive recognition operations of the components respectively sucked by said second component suction nozzles, and

(c) successively mount the components, respectively sucked by said second component suction nozzles, onto a board at said board positioning section upon rotation of said second rotary member.

26. (Previously presented) The component mounting apparatus according to claim 25, wherein

said first mounting head section further includes first nozzle rotation driving mechanisms for rotating said first component suction nozzles about the first respective axes, respectively, with said first mounting head section also being constructed and arranged to rotate said first component suction nozzles, via said first rotation driving mechanisms, respectively about the first respective axes in accordance with recognition results from said first recognition section so as to perform successive adjustment of postures of the components sucked by said first component suction nozzles, and

said second mounting head section further includes second nozzle rotation driving mechanisms for rotating said second component suction nozzles about the second respective axes, respectively, with said second mounting head section also being constructed and arranged to rotate said second component suction nozzles, via said second rotation driving mechanisms, respectively about the second respective axes in accordance with recognition results from said second recognition section so as to perform successive adjustment of postures of the components sucked by said second component suction nozzles.

27. (Previously presented) The component mounting apparatus according to claim 26, wherein

said first and second rotary members are each constructed and arranged to rotate at a lower speed at an end of rotation thereof with respect to a speed at a start of the rotation.

28. (Previously presented) The component mounting apparatus according to claim 26, wherein

said first and second mounting head sections are independently movable between said component supply sections and said board positioning section, respectively, and

said first mounting head section is constructed and arranged to perform successive mounting of components onto the board positioned at said board positioning section while said second mounting head section is used to perform successive component suction at a corresponding one of said component supply sections and successive component recognition at said second recognition section.

29. (Previously presented) The component mounting apparatus according to claim 28, wherein

one of said first and second mounting head sections is constructed and arranged to mount components at high speed, and the other of said first and second mounting head sections is constructed and arranged to mount components that require mounting with a high degree of precision.

30. (Previously presented) The component mounting apparatus according to claim 26, wherein

either of said first and second mounting head sections is constructed and arranged to be selectively operated in accordance with a type of board positioned at said board positioning section, and

one of said first and second mounting head sections is constructed and arranged to mount larger components, and the other of said first and second mounting head sections is constructed and arranged to mount smaller components.

31. (Previously presented) The component mounting apparatus according to claim 26, wherein

either of said first and second mounting head sections is constructed and arranged to perform suction of larger components after finishing suction of smaller components.

32. (Previously presented) The component mounting apparatus according to claim 26, wherein

either of said first and second mounting head sections is constructed and arranged to mount smaller components after mounting larger components.

Claims 33-46 (Cancelled)

47. (Previously presented) A component mounting assembly including component mounting apparatuses positioned along a board transfer path, each of said component mounting apparatuses comprising:

first and second component supply sections for accommodating a plurality of components, said component supply sections being arranged on opposite sides of a board positioning section, respectively;

a first mounting head section including

(i) a first rotary member constructed and arranged to be rotatively driven about a first horizontal axis,

(ii) first component suction nozzles attached to said first rotary member along respective first axes, and

(iii) a first recognition section opposed to said first rotary member, said first mounting head section being constructed and arranged to

(a) perform successive suction operations in order to pick up components from said first component supply section via said first component suction nozzles, respectively,

(b) perform, via said first recognition section upon intermittent rotation of said first rotary member, successive recognition operations of the components respectively sucked by said first component suction nozzles, and

(c) successively mount the components, respectively sucked by said first component suction nozzles, onto a board at said board positioning section upon intermittent rotation of said first rotary member; and

a second mounting head section including

(i) a second rotary member constructed and arranged to be rotatively driven about a second horizontal axis,

(ii) second component suction nozzles attached to said second rotary member along respective second axes, and

(iii) a second recognition section opposed to said second rotary member, said second mounting head section being constructed and arranged to

(a) perform successive suction operations in order to pick up components from said second component supply sections via said second component suction nozzles, respectively,

(b) perform, via said second recognition section upon intermittent rotation of said second rotary member, successive recognition operations of the components respectively sucked by said second component suction nozzles, and

(c) successively mount the components, respectively sucked by said second component suction nozzles, onto the board at said board positioning section upon intermittent rotation of said second rotary member,

wherein all of said first component supply sections are positioned on one side of the board transfer path, and all of said second component supply sections are positioned on another side of the board transfer path.

48. (Previously presented) A component mounting assembly including component mounting apparatuses positioned along a board transfer path, each of said component mounting apparatuses comprising:

first and second component supply sections for accommodating a plurality of components, said component supply sections being arranged on opposite sides of a board positioning section, respectively;

a first mounting head section including

(i) a first rotary member constructed and arranged to be rotatively driven about a horizontal axis, and

(ii) first component suction nozzles attached to said first rotary member along first respective axes;

a second mounting head section including

(i) a second rotary member constructed and arranged to be rotatively driven about a horizontal axis, and

(ii) second component suction nozzles attached to said second rotary member along second respective axes;

a first recognition section; and

a second recognition section,

wherein said first mounting head section is constructed and arranged to

(1) perform successive suction operations in order to pick up components from said first component supply section via said first component suction nozzles,

(2) move to said first recognition section so as to have performed, upon rotation of said first rotary member, successive recognition operations of the components respectively sucked by said first component suction nozzles, and

(3) successively mount the components, respectively sucked by said first component suction nozzles, onto a board at said board positioning section upon rotation of said first rotary member,

wherein said second mounting head section is constructed and arranged to

(1) perform successive suction operations in order to pick up components from said second component supply sections via said second component suction nozzles,

(2) move to said second recognition section so as to have performed, upon rotation of said second rotary member, successive recognition operations of the components respectively sucked by said second component suction nozzles, and

(3) successively mount the components, respectively sucked by said second component suction nozzles, onto a board at said board positioning section upon rotation of said second rotary member, and

wherein all of said first component supply sections are positioned on one side of the board transfer path, and all of said second component supply sections are positioned on another side of the board transfer path.

49. (Previously presented) The component mounting apparatus according to claim 1, wherein

said first mounting head section is constructed and arranged to successively mount the components, respectively sucked by said component suction nozzles of said first mounting head section, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said component suction nozzles of said first mounting head section, and

said second mounting head section is constructed and arranged to successively mount the components, respectively sucked by said component suction nozzles of said second mounting head section, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said component suction nozzles of said second mounting head section.

50. (Previously presented) The component mounting apparatus according to claim 25, wherein

said first mounting head section is constructed and arranged to successively mount the components, respectively sucked by said first component suction nozzles, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said first component suction nozzles, and

said second mounting head section is constructed and arranged to successively mount the components, respectively sucked by said second component suction nozzles, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said second component suction nozzles.

Claims 51-54 (Cancelled)

55. (Previously presented) The component mounting assembly according to claim 47, wherein

said first mounting head section is constructed and arranged to successively mount the components, respectively sucked by said first component suction nozzles, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said first component suction nozzles, and

said second mounting head section is constructed and arranged to successively mount the components, respectively sucked by said second component suction nozzles, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said second component suction nozzles.

56. (Previously presented) The component mounting assembly according to claim 48, wherein

said first mounting head section is constructed and arranged to successively mount the components, respectively sucked by said first component suction nozzles, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said first component suction nozzles, and

said second mounting head section is constructed and arranged to successively mount the components, respectively sucked by said second component suction nozzles, onto the board at said board positioning section by mounting all of the sucked components before another component is picked up by any of said second component suction nozzles.

57. (Previously presented) The component mounting apparatus according to claim 1, wherein said component supply sections are arranged on opposite sides of a board transfer path in which is provided said board positioning section.

58. (Previously presented) The component mounting apparatus according to claim 25, wherein said component supply sections are arranged on opposite sides of a board transfer path in which is provided said board positioning section.

Claims 59-60 (Cancelled)